



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,975	07/08/2004	Chihiro Kawai	50389-052	3373

7590 08/09/2006

McDermott Will & Emery
600 13th Street N W
Washington, DC 20005-3096

EXAMINER

ARENA, ANDREW OWENS

ART UNIT PAPER NUMBER

2811

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

3

Office Action Summary	Application No. 10/500,975	Applicant(s) KAWAI ET AL.	
	Examiner Andrew O. Arena	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2004.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
4a) Of the above claim(s) 6-28, 34-45 and 48-60 is/are withdrawn from consideration.
5) ☒ Claim(s) 29-33, 46, 47, 61 and 62 is/are allowed.
6) ☒ Claim(s) 1-5 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 08 July 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8 July 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

Reference "JP 2683452", publication date 08/08/1997, has not been considered because a copy of said reference cannot be found. The JPO webpage contains no reference with said document number. Applicant has provided "EP 0653392", but this reference does not match the cited JP document number or publication date. The US equivalent (US 5,618,765) of EP 0653392 has been considered and made of record.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "honeycomb structure", "inflow-side honeycomb passage", "outflow-side honeycomb passage", and "partition" of claim 62 must be shown or the features canceled from the claim. No new matter should be entered.

Fig 32 is objected to under 37 CFR 1.84(p)(5) because it does not include the following reference mentioned in the description: the right in Fig 32 does not include the "porous electrode" mentioned in the specification ([0293] ln 11). It seems that the unlabeled arrow in the bottom right may be this reference.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. See MPEP § 608.02(p).

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Porous UV-emitting semiconductor on porous substrate as sterilizing filter made by filtering suspended semiconductor particles.

The abstract is objected to for excessive length and use of phrases that can be implied. Correction is required. See MPEP § 608.01(b), especially sections C-E.

Claim Objections

Claims 6-28, 34-45, and 48-60 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. Accordingly, claims 6-28, 34-45, and 48-60 have not been further treated on the merits. See MPEP § 608.01(n).

Claims 3, 4, & 54 are objected to because the recitation "a wavelength of X to Y" is awkward. A wavelength must be one discrete value, not a range. An appropriate recitation is "a wavelength in a range of X to Y".

Claims 7, 14, 15, 18, 37, & 57 are objected to because the recitation " $f\hat{E}m$ " is not a recognized unit of length, perhaps applicant intended to recite " fm ".

Claim 29 is objected to because the recitation "filtering the suspension through the porous substrate and forming a deposited layer composed of semiconductor particles" is misleading; it may be read as two separate and independent steps. Applicant should use language that makes it clear that the filtering is what forms the

deposited layer, and that the particles are the same as those from the suspension; for example, "filtering the suspension through the porous substrate, thereby forming a deposited layer of said semiconductor particles on the surface of said porous substrate".

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 3 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim contains subject matter that was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 3 recites a "wavelength of 200 to 400 nm." The specification ([0080] ln 6) purports, without supporting examples or data, an emission wavelength of 200 nm for AlN; examiner notes this was unknown in the art at the time the invention was made.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kumomi (US 5,726,464).

Regarding claim 1, Kumomi discloses (Fig 1) a porous semiconductor, comprising:

a porous substrate (one of the plural layers comprising 2; col 5 ln 3) having continuous (uninterrupted) pores; and

a porous semiconductor layer (another of the plural layers comprising 2) having a light emitting function (luminous) that works by electroluminescence, and having continuous (uninterrupted) pores.

Regarding claims 2-4, Kumomi does not limit his porous semiconductor to any particular material (col 3 ln 40-43), therefore the disclosure of Kumomi encompasses all well-known porous semiconductors, including those which emit ultraviolet light with a wavelength of 400nm or less, particularly a wavelength in a range of 230 to 270 nm.

Regarding claim 5, Kumomi discloses the semiconductor layer has a pn junction structure (col 4 ln 48-50).

Allowable Subject Matter

Claims 29-33, 46, 47, 61, and 62 are allowed.

Examiner's reasons for allowance are that the references of record, alone or in combination do not teach or suggest at least the following limitations:

“filtering the suspension...through the porous substrate”, as required by independent claims 29, 46, and 47;

“the continuous pores lead from an inner wall of the holes to a side of the column, and the porous semiconductor layer is formed on the inner wall”, as required by dependent claim 61; or

“the porous semiconductor layer is formed on the inner walls of the inflow-side honeycomb passage”, as required by dependent claim 62.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

The prior art made of record and not relied upon is considered pertinent.

Shor (US 5,569,932) teaches that porous SiC emits UV light.

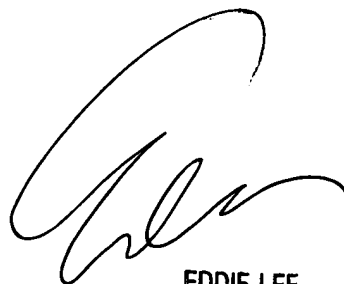
The American Heritage Stedman's Medical Dictionary defines ultraviolet as “...wavelengths from about 4 nm...to about 380 nm.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew O. Arena whose telephone number is (571) 272-5976. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Andrew O Arena
2 August 2006

A handwritten signature in black ink, appearing to read 'Eddie Lee', with a large, sweeping initial 'E'.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800